



**WEST BENGAL STATE UNIVERSITY**  
B.A./B.Sc. Honours 1st Semester Examination, 2020, held in 2021

**CMAACOR02T-COMPUTER APPLICATION (CC2)**

**COMPUTER FUNDAMENTALS**

Time Allotted: 2 Hours

Full Marks: 50

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

**Answer Question Number 1 and any four from the rest**

1. Answer any **five** questions from the following: 2×5 = 10
  - (a) Distinguish between System Software and Application Software.
  - (b) Using 2's complement method find the value of  $(15)_{10} - (27)_{10}$ .
  - (c) State the advantage of 2's complement representation over 1's complement representation.
  - (d) Distinguish between Combinational and Sequential Circuit.
  - (e) Distinguish between Sequential and Random Access memory.
  - (f) Why is primary memory faster than the secondary memory?
  - (g) What is the difference between Address Bus and Data Bus?
  - (h) What is the use of the device driver?
  
2. (a) What are the essential components of a digital computer? Draw the schematic (2+2+4)+2 block diagram of a digital computer showing its essential components. Discuss the function of each component.
- (b) What do you mean by a System Software? Give an example.
  
3. (a) In a certain number systems X and Y are two successive digits. When written as 4+(3+3) XY, the decimal equivalent is 25 and when written as YX, the decimal equivalent is 31. Find X and Y and the base of the system.
- (b) Convert  $(2148.87)_{10}$  into the following two bases:
  - (i) Octal
  - (ii) Binary
  
4. (a) What do you mean by min-term and max-term of a Boolean expression? (2+6)+2 Minimize the Boolean function
$$F(A, B, C, D) = \sum m(0, 2, 3, 6, 7, 12, 13, 14) + \sum d(1, 4, 11, 15).$$
- (b) Show that the dual of XOR is equal to its complement.

5. (a) Implement XOR gate with NAND gate. 4+4+2  
(b) Explain Full Adder with Truth Table.  
(c) What is a priority encoder?
6. (a) What do you mean by a Race Condition? How will you remove it by Master-Slave JK Flip-flop? (1+2)+3+4  
(b) Design a Flip-Flop using NAND Gate.  
(c) Design a 4-bit Ripple Counter.
7. (a) What is the purpose of ports, buses and controllers in the I/O system? 2+(2+2)+(2+2)  
(b) What is the function of a Cache Memory? What is the purpose of OCR software in optical character recognition?  
(c) What is the purpose of providing registers in a CPU? Explain the role of Timing and Control unit of a CPU.
8. Write short notes on any *two* of the following: 5+5  
(a) Cloud Computing  
(b) Data Mining  
(c) Embedded Systems  
(d) e-Library.

**N.B. :** *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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